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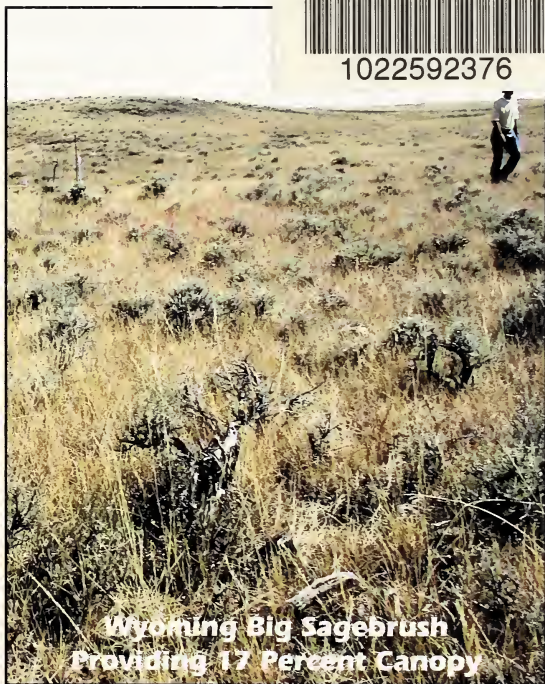
United States Department of Agriculture
Natural Resources Conservation Service
Plant Materials Center
Bismarck, North Dakota

Sage-Grouse Habitat Restoration Getting Started in the Dakotas

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**Wyoming Big Sagebrush
Providing 17 Percent Canopy**

Helping People Help the Land

Sage-Grouse Habitat

Greater sage-grouse *Centrocercus urophasianus* is a large, ground-feeding bird whose habitat includes the big sagebrush rangeland in the western Dakotas. This game bird was never widespread in North Dakota. In 1950, active sage-grouse leks or strutting grounds were found over roughly 800 square miles in Bowman, Slope, and Golden Valley Counties. Currently, active leks are found in an area of about 490 square miles in extreme southwestern North Dakota. In South Dakota, sage-grouse are found in Harding, Butte and Fall River Counties. Big sagebrush *Artemisia tridentata* is a key species in the desired plant community. Sage-grouse feed almost exclusively on big sagebrush leaves in the winter. Good big sagebrush canopy should range from 15 to 30 percent of the cover. Big sagebrush canopy exceeding 30 percent, or lacking in understory structure, can lower sage-grouse habitat quality and plant diversity.

Big Sagebrush

Big sagebrush is divided into three main subspecies adapted to different growing conditions. It is important to choose the proper subspecies and adapted seed source to match the soil conditions.

Wyoming big sagebrush

- *Artemisia tridentata* ssp. *wyomingensis*
- Maximum height is 1.5 - 3.0 feet
- Form is basally branched, rounded, with an uneven top
- The most drought tolerant of the big sagebrush subspecies
- Prefers dry, shallow, gravelly soils
- Fire intolerant, does not sprout after a fire
- 2,500,000 seeds/lb

Two subspecies of big sagebrush found in the Dakotas are Wyoming big sagebrush and mountain big sagebrush. Wyoming big sagebrush is more common, and should be planted in North Dakota and South Dakota. Big sagebrush plants will not produce viable seed every year. A good seed crop can be expected about every ten years. Seed of both of these subspecies is very short-lived and is fragile when improperly handled.

Re-establishment

Sage-grouse habitat can be established on disturbed lands by reclaiming with diverse plant communities that include native forbs, grasses, and shrubs. Big sagebrush can be established using either seed or plants. Containerized stock or bare root seedlings can be planted in the spring with high establishment success (50 percent or greater). It is important to use material that is adapted to the site. Plants can be purchased from a nursery, or wild plants can be dug and transplanted during dormancy in the fall or very early spring. To establish the seedlings, it is recommended they be randomly placed in clumps or blocks on the best sites for restoring big sagebrush. Seedlings planted in natural blocks or clumps become fertile islands of big sagebrush as they mature, produce seed, and spread.

Establishment of big sagebrush from seed can be difficult, especially in dry conditions. Big sagebrush is usually seeded in a mix of grasses and other forbs. A grass drill should be used whenever possible. If surface residue is not excessive to prevent seed to soil contact, it is recommended that the seed tubes be pulled from the legume box, and the big sagebrush seed, if mixed with wildflower seed, be allowed to fall directly on the ground without going through the disk openers. This keeps the big sagebrush seed out of the drill rows, reducing the grass competition. It also allows the seed to be planted at a shallow depth.

The action of the disks and packer wheels will provide some soil coverage. The following specifications should be used for a successful seeding.

- Seed only on a firm seedbed
- Seed in late fall
- Seed shallow, 1/8 inch or less
- Seed approximately 0.1 - 0.5 PLS lb/ac (5-30 seeds/ft²)
- Seeding method:
 - 1) Seed on surface with grass drill and allow packer wheels to lightly cover the seed; or
 - 2) Broadcast and harrow, doubling the seeding rate

Seed Mixes

Depending on the soils and site conditions, there are a number of seed mixes suited to sage-grouse habitat. Seeding rates should be doubled for those species planted when the seed is broadcast directly on the ground. Always use approved varieties for your area, or northern adapted seed sources if varieties are unavailable. Listed below are two examples of seed mixes based on different ecological sites.

Very Shallow to Very Deep Clays and Loams¹

Native Species	PLS lb/ac
big sagebrush	0.10-0.50
green needlegrass	0.90
slender wheatgrass	0.50
sidecoats grama	0.60
western wheatgrass/ thickspike wheatgrass	0.40
blue grama	0.20
purple prairieclover	0.40
white prairieclover	0.40
blanketflower	0.70
western yarrow	0.04
yellow coneflower	0.10
Total	4.34-4.74

¹Consult Ecological or Range Site Descriptions for your MRLA.

Sandy Loams and Shallow Sandy Loams¹

Native Species	PLS lb/ac
big sagebrush	0.10-0.50
little bluestem	0.40
needle-and-thread	0.95
western wheatgrass/ thickspike wheatgrass	0.40
prairie sandreed	0.40
bluebunch wheatgrass	1.20
purple prairieclover	0.40
white prairieclover	0.40
shell-leaf penstemon	0.40
western yarrow	0.04
yellow coneflower	0.10
Total	4.79-5.19

¹Consult Ecological or Range Site Descriptions for your MRLA.

Managing Big Sagebrush Plantings

Big sagebrush seed is quite small. Seed may remain dormant in the soil for varying lengths of time. Seedlings are slow growing and often less competitive than most other species occurring in the same habitat. After seeding, the restored site should be rested, or protected from grazing for at least 2-3 years to allow time for the shrubs, forbs, and grasses to become fully established. Optimum desired canopy cover for big sagebrush for sage-grouse habitat is 15-30 percent. If a mature plant has a diameter of 3 feet, the desired spacing would be one plant per 47 ft².

A plant guide for big sagebrush has been developed by the Aberdeen Plant Materials Center and can be accessed through the PLANTS database at <http://plants.usda.gov>.

For more information, contact:

USDA-NRCS Plant Materials Center
3308 University Drive
Bismarck, ND 58504
Phone: (701) 250-4330
Fax: (701) 250-4334

<http://Plant-Materials.nrcs.usda.gov>

Key Points to Remember

- ✓ Is the seeding necessary?
- ✓ The best chance of seeding success is on the best soils.
- ✓ New seedlings will only be successful on those sites with adequate moisture conditions and freedom from heavy weed competition.
- ✓ New seedlings must be protected from grazing or browsing for 2-3 years.
- ✓ Plant shallow (1/8 inch or less) with adapted source identified seed sources.

References

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